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A Botanist's Summer in Costa Rica

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It was the writer's good fortune to spend July and August of 1940 in the little republic of Costa Rica, which has been characterized by Gunther[1] as "one of the most delightful countries in the world and one of the purest democracies on earth." It has moreover a particularly interesting flora, especially to the student of ferns. According to the North American Flora, it is headquarters for Gleicheniaceae, with an array of endemic species, hence a trip was arranged so as to provide a two-weeks' stay in Jamaica, a week on Barro Colorado Island, C. Z., and the balance of the season in Costa Rica. During most of the time the writer was accompanied by his colleague, Dr. W. E. Roever, whose cooperation was invaluable.

One gains a lasting impression of the vertical distribution of the plant life by looking out of the window from the train which takes him from Port Limon to the capital, San José—a trip of only a hundred miles which nevertheless occupies about six hours. Starting from the banana groves near the coast, the traveler passes through real jungle with reappearance of bananas, coconuts and cacao at every settlement—the *tierra caliente*. Presently the lower stretches of the Reventazon River are reached, and the road begins a series of sharp curves and steep grades as it follows the course of the rushing river. By the time an elevation of 2000 feet is reached, coffee has replaced the banana as the leading crop, giving an entirely different aspect to the landscape, for the coffee shrubs grow in the partial shade of such trees as species of *Inga,* and during August are bright by reason of the ripe red berries which contain the familiar coffee "bean." The railroad banks are enlivened by the brilliant flowers of *Heliconia* and *Costus,* representing monocotyledonous families quite unknown to northern floras.

[1] Gunther, John. Inside Latin America. Harper & Brothers, New York, 1941.

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We are now passing into the *tierra templada* of Standley,[2] the region in which most of the population is found. The curves become sharper and the grades if possible more steep, as we realize when a brisk shower descends and the track becomes so slippery that the train is stalled until the rails are sanded and the plucky little engine jerks the train into motion, while we breathe more easily although we realize that perhaps we should have bought some of that fried chicken which was offered at the car windows while we stopped at Turrialba. The view of river and mountains grows more expansive, and Roever's Leica is in frequent use. At length an altitude of 5137 feet is attained at the Continental Divide just beyond Cartago, the former capital, which was levelled by an earthquake thirty-odd years ago. The train slides down the remaining ten miles to San José, situated at an altitude of 3800 feet among the coffee plantations in the saucer-shaped "meseta central."

San José was our headquarters for most of the two months, and was convenient because of the bus lines radiating in every direction. Under the guidance of Director Valerio and Dr. A. Skutch of the Museo Nacional, we made our first excursion to the *tierra fria,* going by auto on one of the few paved roads until an elevation of 6800 feet was reached, where we found the way blocked by a landslide. So we finished on foot the few miles to the hamlet called Varra Blanca, where we spent a memorable week. Here no crops except potatoes are raised, and the universal industry is dairying. Milk, tortillas, beans and rice are the staple articles of diet. As we wandered out into the fields we were at once attracted by huge pink bouquets formed by old oak trunks covered with climbing shrubs belonging to the ericaceous genus *Cavendishia.* The dominance of epiphytes astonished us until it was realized that these plants enjoyed plenty of light, air and water, also immunity from grazing animals. Every tree had its assortment of "air-plants," chiefly ferns and orchids. One large shaggy species of *Trichomanes* (*T. lucens*) attracted attention, also what appeared to be a fleshy spleenwort (*Enterosora spongiosa*). One tree was beautifully mantled by a vigorous specimen of the familiar *Polypodium aureum,* below which a border of *Nephrolepis pendula* was added by way of good measure. The fragrant *Asplenium auritum* adorned the base of most trees,

[2] Standley, P. C. Flora of Costa Rica, part 1. Chicago, 1937.

while the dainty *Rhipidopteris peltata* grew in masses on fallen trunks. Presently the usual afternoon shower drove us to cover, where we hastened to get our treasures into the drier or into pickle ere the quick tropical night descended and we had to depend on candle light.

The scientific peak of the whole trip was reached when on a hillside near our stopping place we found eight species of *Dicranopteris* (a segregate of *Gleichenia*) including the endemic *D. costaricensis* and the remarkable *D. retroflexa*. *D. Bancroftii* (Fig. 1) afforded a surprise, for instead of the single fork bearing two leaflets found

FIGURE 1. *Dicranopteris Bancroftii* filling a small ravine; the branches of the leaves are two feet long. Varra Blanca, C. R. Alt. 6000 ft.

earlier in Jamaican plants, forks of the second, third and even fourth order were characteristic of the plants in a ravine near those endemic species. Stream banks displayed a huge herbaceous *Senecio* (*Cooperi*) and an equally large *Eupatorium* (*angulare*) while the fuchsia used as a house plant was represented by *F. arborescens* 15 feet high. Melastomes of various genera—trees, shrubs, and herbs —were of constant occurrence, some as beautiful as climbing roses (*Blakea spp.*). From Varra Blanca Dr. Roever took a memorable

trip to the crater of Volcan Poas (8300 feet), bringing back *Drimys Winteri,* famous because although it is a dicotyledon its wood shows tracheids in place of vessels. Other prizes were certain rare ericads and the immigrant conifer from South America, *Podocarpus montanus.*

Our next trip afforded a chance to sample the rich flora of a region at an altitude of 2,200 feet, San Isidro del General. This village in the midst of a bean growing region has the distinction of having skipped some of the usual evolutionary stages of a community, such as horse and carriage, automobile, railroad, telegraph and telephone, for it has leaped from the ox-cart stage to airplane and radio. Half an hour by plane covered the journey from San José, although by mule-back over the ridges five days used to be consumed. We were particularly impressed at San Isidro by the variety of tree ferns and the pendent species of *Lycopodium.* Although the roadsides showed some highly colored flowers, the only conspicuous angiosperms in the rain forest were the orchid-like *Orchillium Endresii*—a large-flowered member of the bladderwort family—and *Cephaelis* spp. (Rubiaceae) distinguished by two deep red bracts enclosing each inflorescence. But the Selaginellas of stream-banks, a splendid *Lindsaya* (*lancea*) a climbing *Blechnum,* impressive Dennstaedtias made up for paucity of color.

Another area along the 2,000-foot contour was visited—the valley of the Reventazon River near Turrialba village. The calcareous banks of the river support a varied flora, again consisting chiefly of ferns, but including *Zamia Skinneri,* a species interesting because of its trunk-forming habit. We were hospitably entertained at a coffee plantation by Mrs. Goode, the patron saint of botanists in that region, where every hedge-row presents novel plants, and a bewildering assortment of *Dryopteris* challenges one's observing capacity.

The vicinity of Cartago has been made familiar to biologists by Professor and Mrs. Calvert[3] through the notable volume describing a year's work, chiefly on insects but containing many references to plants. Although the region is much changed during the last thirty years, we still found the slopes of Mt. Carpintera well worth exploring, while the thickets and walls could be depended on to furnish

[3] Calvert, P. P. and A. C. A year of Costa Rican natural history. New York, 1917.

unfamiliar ferns. The chief attraction of the region, however, is the orchid garden of Mr. C. H. Lankester. This is a most remarkable assemblage of orchids of Costa Rica and other tropical countries, blended with ferns and cycads and growing on trees and banks in a charming atmosphere of wildness. The writer was most kindly entertained by the Lankesters, and cannot forget the display of hybrid orchids, some of rich fragrance, which greeted him each morning as he emerged from sleeping quarters. The visit was notable for a number of personally conducted field trips, one to a station for *Ophioglossum palmatum* and another along the newly constructed Pan-American highway.

The difficulties experienced in travelling in Costa Rica are illustrated by another trip. In company with Sr. Leon of the museum we took bus for Heredia, then climbed six miles on a dirt road to the slopes of Volcan Barba. On the way a sudden storm overtook us, as we ate lunch by a friendly bank. Arriving at a schoolhouse we went under the guidance of the schoolmaster to a sulphur spring near which we collected a *Peperomia* which is regarded as a new species. We were allowed to sleep on the floor of the schoolhouse, which we may report as clean and polished, but cold and drafty. It was on this trip that we found *Botrychium cicutarium, B. underwoodianum* and *Ophioglossum reticulatum,* at altitude 6,500 feet. It was in a similar locality that we found *Gunnera insignis,* a plant provided with leaves so large that they are used as umbrellas by the natives.

Our advisers did not encourage us to brave the dangers of malaria by venturing into the Province of Guanacaste, on the Pacific slope. The climate of San José is so healthful, and relatively easy excursions are so many that our remaining trips were made in the neighborhood of the capital. On the last day of August we took train for Port Limon, feeling content at having accomplished at least the main objects of the trip.

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